Listing of Claims:

What is claimed is:

1. (currently amended) An apparatus for decoding data comprising:

an array of storage elements having [[N]] rows and [[M]] columns, wherein an input of each element in [[each]] a column ~~may receive~~ receives data from only two sending [[R]] elements of a previous column and an output of each element in [[each]] the column is ~~may be~~ received by [[R]] only two receiving elements in a next column, wherein the receiving elements are physically the closest to each element in the column, and

wherein said inputs and outputs are logically interconnected according to an encoder polynomial for an error correction code.

2. (original) The apparatus as in claim 1 wherein said encoder polynomial is a Viterbi encoder polynomial.

3. (canceled)

4. (canceled)

5. (currently amended) The apparatus as in claim 2 wherein [[M]] the number of columns is equivalent to the depth of a Viterbi trellis.

6. (currently amended) The apparatus as in claim 5 wherein [[M =]] <u>the number of columns is</u> 64.

7. (currently amended) The apparatus as in claim 1 further comprising:

selection signals for selecting data for each element in [[each]] <u>the</u> column from said [[R]] <u>sending</u> elements of a previous column, said selection signals generated based on a minimum path metric associated with each storage element.

8. (currently amended) The apparatus as in claim 7 wherein [[N]] selection signals select data for elements in each of said [[N]] rows in said matrix, thereby specifying for all [[M]] elements in each row which of said [[R]] elements from a previous column to select [[data]], said selections causing data to propagate through said matrix according to said encoder polynomial.

9. (currently amended) The apparatus as in claim 8 wherein said selection signals are generated by add-compare-select units selecting the lowest of [[R]] potential path metrics.

10. (canceled)

11. (original) The apparatus as in claim 1 further comprising minimization logic to identify a storage element in a final column of said matrix from which to select data.

12. (original) The apparatus as in claim 11 wherein said minimization logic identifies said storage element based on said storage element having a minimum path metric associated therewith.

13. (currently amended) The apparatus as in claim 12 wherein said minimum path metric is determined based on a minimum of [[N]] accumulator values of add-compare-select units associated with each of said [[N]] rows.

14. (currently amended) A forward-tracing array for decoding data comprising:

a matrix of storage elements having [[N]] rows and [[M]] columns;

connection logic for interconnecting said storage elements across columns according to an encoder polynomial such that ~~each element~~ storage elements in a column [[may]] receive data from [[R]] storage elements in a previous column; [[and]]

selection logic for selecting storage elements from said [[R]] storage elements from which to read data based on a calculated path metric associated with each of said [[R]] storage elements; and

minimization logic to identify a storage element in a final column of said matrix from which to select data based on said storage element having a minimum path metric associated therewith which is found using a binary tree search to form a one-hot vector having a bit therein that corresponds to said minimum path metric.

15. (original) The apparatus as in claim 14 wherein said encoder polynomial is a Viterbi encoder polynomial.

16. (currently amended) The apparatus as in claim 14 wherein ~~R=2 for an~~ said encoder polynomial includes a rate of 1/2.

17. (currently amended) The apparatus as in claim 14 wherein ~~R=3 for an~~ said encoder polynomial includes a rate of 1/3.

18. (currently amended) The apparatus as in claim 15 wherein [[M]] the number of columns is equivalent to the depth of a Viterbi trellis.

19. (currently amended) The apparatus as in claim 18 wherein [[M =]] the number of columns is 64.

20. (currently amended) The apparatus as in claim 14 wherein said selection logic further comprises:

[[N]] selection signals to select data for [[M]] elements in each of said [[N]] rows in said matrix, thereby specifying for all [[M]] elements in each row which of said [[R]] elements from a previous column to select [[data]], said selections causing data to propagate through said matrix according to said encoder polynomial.

21. (currently amended) The apparatus as in claim 20 wherein storage elements in a first column of said matrix are loaded with constant values and said selection signals select data for [[M-1]] elements in each of said [[N]] rows.

22. (currently amended) The apparatus as in claim 21 wherein said selection signals are generated by add-compare-select units selecting the lowest of [[R]] potential path metrics.

23. (canceled)

24. (canceled)

25. (canceled)

26. (currently amended) The apparatus as in claim [[25]] 14 wherein said minimum path metric is determined based on a minimum of [[N]] accumulator values of add-compare-select units associated with each of said [[N]] rows.

27. (currently amended) A machine-readable medium having code stored thereon which defines an integrated circuit (IC), said IC comprising:

an array of storage elements having [[N]] rows and [[M]] columns, wherein an input of each element in [[each]] a column ~~may receive~~ receives data from only two sending [[R]] elements of a previous column and an output of each element in a

[[each]] the column is ~~may be~~ received by [[R]] only two receiving elements in a next column, wherein the receiving elements are physically the closest to each element in the column, and

wherein said inputs and outputs are logically interconnected according to an encoder polynomial for an error correction code.

28. (original) A machine-readable medium as in claim 27 wherein said encoder polynomial is a Viterbi encoder polynomial.

29. (canceled)

30. (canceled)

31. (currently amended) A machine-readable medium as in claim 28 wherein [[M]] the number of columns is equivalent to the depth of a Viterbi trellis.

32. (currently amended) A machine-readable medium as in claim 31 wherein [[M =]] the number of columns is 64.

33. (currently amended) A machine-readable medium as in claim 27 further comprising:

selection signals for selecting data for each element in each column from said [[R]] elements of a previous column, said selection signals generated based on a minimum path metric associated with each storage element.

34. (currently amended) A machine-readable medium as in claim 33 wherein [[N]] selection signals select data for elements in each of said [[N]] rows in said matrix, thereby specifying for all [[M]] elements in each row which of said [[R]] elements from a previous column to select [[data]], said selections causing data to propagate through said matrix according to said encoder polynomial.

35. (currently amended) A machine-readable medium as in claim 34 wherein said selection signals are generated by add-compare-select units selecting the lowest of [[R]] potential path metrics.

36. (canceled)

37. (original) A machine-readable medium as in claim 27 further comprising minimization logic to identify a storage element in a final column of said matrix from which to select data.

38. (original) A machine-readable medium as in claim 37 wherein said minimization logic identifies said storage element based on said storage element having a minimum path metric associated therewith.

39. (currently amended) A machine-readable medium as in claim [[12]] <u>38</u> wherein said minimum path metric is determined based on a minimum of [[N]] accumulator values of add-compare-select units associated with each of said [[N]] rows.